

PART I: DESCRIPTION OF THE PROPOSED CHANGE, BACKGROUND, AND SCHEDULE

1. Describe the aspects of the issue being evaluated and its expected effects.

The issue is that the process of establishing the seismic analysis and design approach on the project has resulted in the need for a number of modifications to the Authorization Basis. The proposed modifications affect the design requirements and implementing standards for seismic and other natural phenomena hazards (NPH) contained in SRD Safety Criteria 4.1-2, 4.1-3, 4.1-4, and 4.1-5.

Note: DOE RU letter 99-RU-0304 dated May 14, 1999 provided conditional approval of 0.26g as the peak ground acceleration for the RPP-WTP design basis earthquake. The response to the RU letter was transmitted by BNFL letter 003946 dated June 14, 1999.

2. Identify the parameters, programs, procedures and systems affected by the issue.

The modifications affect those portions of the SRD identified above. Modifications to other parts of the Authorization Basis are not required.

3. Identify the credible failure modes associated with the proposed issue.

This change addresses the identification of design requirements and implementing standards for seismic and other natural phenomena hazards. Failure modes are not affected by this change.

4. List the references to location of information used for the safety evaluation.

- BNFL-5193-SRD-01, Rev 2, TWRS-P Project Safety Requirements Document, Volume II, Section 4.1
- "TWRS-P Facility Design Basis Earthquake - Peak Ground Acceleration, Seismic Response Spectra, and Seismic Design Approach," RPT-W375-RU00002, Rev. 2, dated June 9, 1999
- "Applicability of DOE Documents to the Design of the TWRS-P Facility for Natural Phenomena Hazards," RPT-W375-RU00003, Rev. 1, dated June 9, 1999
- "Validation of the Geomatrix Hanford Seismic Report for Use on the TWRS Privatization Project," RPT-W375-RU00004, Rev. 0, dated March 17, 1999
- "Seismic Analysis and Design Approach," RPT-W375-RU00005, Rev. D, dated August 6, 1999
- SIN-W375-99-00032, "Implementing Standards for NPH Analysis and Design"

5. Describe the planned implementation schedule.

The revised safety criteria will be implemented upon RU review and acceptance. The safety criteria are applicable throughout the RPP-WTP Facility design, construction, operation, and deactivation.

PART II: POTENTIAL IMPACT ON QUALITY ASSURANCE; RADIATION PROTECTION; SAFETY REQUIREMENTS DOCUMENT; TECHNICAL SAFETY REQUIREMENTS; REGULATORY COMMITMENTS; PROGRAM AND PROCEDURE EFFECTIVENESS; AND DESIGN BASIS

1. Does the proposed change affect the RPP-WTP Quality Assurance Program?
NO. The proposed changes to Safety Criteria 4.1-2 through 4.1-5 have no impact on the RPP-WTP QA Program.
2. Does the proposed change affect the RPP-WTP Radiation Protection Program?
NO. The proposed changes to Safety Criteria 4.1-2 through 4.1-5 have no impact on the RPP-WTP Radiation Protection Program.
3. Does the proposed change involve the deletion or modification of a standard previously identified or established in the approved SRD?
YES. Changes to both the listed requirements and the implementing standards are required in SRD Safety Criteria 4.1-2, 4.1-3, 4.1-4, and 4.1-5. Current implementing standards are both modified and deleted, and new implementing standards are added.
4. Does the proposed change involve the modification of an approved Technical Safety Requirement?
N/A. This question applies after issuance of the Production Operations Authorization.
5. Does the proposed change result in a reduction in commitment currently described in the Authorization Basis?
NO. The proposed change incorporates modifications that are equivalent or more conservative than existing requirements.
Note: The proposed change, when approved, will incorporate the requirements of Commitment 1 of RU letter 99-RU-0151 (BNFL Commitment 001762-07).
6. Does the proposed change result in a reduction in the effectiveness of any program, procedure, or plan described in the Authorization Basis?
NO. The proposed change does not reduce the effectiveness of any program, procedure or plan described in the Authorization Basis. This is because the proposed change incorporates modifications that are equivalent or more conservative than existing requirements.
7. Does the proposed change result in an Unreviewed Safety Question?
N/A. This question applies after issuance of the Production Operations Authorization.

PART III: IMPACT ON THE ACCIDENTS EVALUATED AS THE DESIGN BASIS

N/A. This section applies after issuance of the Production Operations Authorization.

PART IV: POTENTIAL FOR CREATION OF A DIFFERENT TYPE OF UNANALYZED EVENT

N/A. This section applies after issuance of the Production Operations Authorization.

PART V: IMPACT ON THE MARGIN OF SAFETY

N/A. This section applies after issuance of the Production Operations Authorization.

Part VI: SAFETY EVALUATION CONCLUSION

Based on the evaluation in Part II, and as applicable, Parts III, IV, and V, the proposed change:

Quality Assurance Program

- ☒ Does not involve a change of the Quality Assurance Program and Implementation Plan
- ☐ Does involve a change of the Quality Assurance Program and Implementation Plan and requires an evaluation in accordance with Appendix 3 of this Code of Practice.

Radiation Protection Program

- ☒ Does not involve a change of the Radiation Protection Program.
- ☐ Does involve a change of the Radiation Protection Program and requires an evaluation in accordance with Appendix 4 of this Code of Practice.

Safety Requirements Document

- ☐ Does not involve the deletion or modification of a standard previously identified or established in the approved SRD.
- ☒ Does involve the deletion or modification of a standard previously identified or established in the approved SRD and requires the preparation and attachment of an Authorization Basis Amendment Request to this form.

Technical Safety Requirements

- ☒ Does not involve the modification of an approved Technical Safety Requirement.
- ☐ Does involve the modification of an approved Technical Safety Requirement and requires the preparation and attachment of an Authorization Basis Amendment Request to this form.

Regulatory Commitments


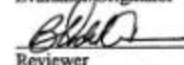
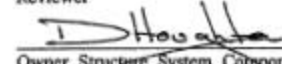

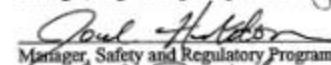



- ☒ Does not result in a reduction in commitment described in the Authorization Basis.
- ☐ Does result in the reduction in commitment described in the Authorization Basis and requires the preparation and attachment of an Authorization Basis Amendment Request to this form.

Program, Plan, and Procedure Effectiveness

- ☒ Does not result in a reduction in the effectiveness of any program, procedure, or plan described in the Authorization Basis.
- ☐ Does result in a reduction in the effectiveness of a program, procedure, or plan described in the Authorization Basis and requires the preparation and attachment of an Authorization Basis Amendment Request to this evaluation form.

Unreviewed Safety Question

- ☒ Does not constitute an Unreviewed Safety Question.
- ☐ Does constitute an Unreviewed Safety Question and requires the preparation and attachment of an Authorization Basis Amendment Request to this evaluation form.

	<u>9/3/99</u>
Evaluator/Originator	Date
	<u>9/7/99</u>
Reviewer	Date
	<u>9/7/99</u>
Owner, Structure, System, Component, Program, Plan, or Procedure	Date
	<u>9/8/99</u>
Manager, Engineering or Operations	Date
	<u>9/7/99</u>
Manager, Safety and Regulatory Programs	Date
	<u>9/7/1999</u>
Manager, Quality Assurance*	Date
	<u>9/9/99</u>
Chairman, Project Safety Committee*	Date
	<u>9/7/99</u>
RPP-WTP Project Manager*	Date

* Only those safety evaluations with a determination that prior Regulatory Unit approval of the proposed change is required.

X.0* DOE-STD-1020-94, "Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities"

* When the ABAR is approved and incorporated, "X.0" will be replaced by the next section number in Appendix C to Volume II of the SRD.

Revision: Change Notice #1 dated 1/96 and DOE Newsletter dated 1/22/98 (Interim Advisory on Straight Winds and Tornados)

Sponsoring Organization: DOE

RPP-WTP Specific Tailoring

The following tailoring of DOE-STD-1020-94 is required for use by BNFL as an Implementing Standard for seismic analysis and design.

Page 1-6, Section 1.3, Evaluation of Existing Facilities

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Page 2-1, Section 2.2, General Approach for Seismic Design and Evaluation

Use 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Design PC-3 (Seismic Category I) SSCs for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft) with no credit for inelastic energy absorption. Note: Credit for inelastic energy absorption is allowed in the design of PC-3 (Seismic Category II) SSCs.

Justification: This change is made for consistency with NRC acceptance criteria.

Use ASCE 4-98 (Draft) in lieu of ASCE 4-86.

Justification: ASCE 4-98 (Draft) is more current.

Page 2-6, Section 2.3, Seismic Design and Evaluation of Structures, Systems, and Components

Perform performance categorization of SSCs per SRD Safety Criteria 4.1-3 and 4.1-4 in lieu of DOE-STD-1021-93.

Justification: DOE-STD-1021-93 is inconsistent with the top-level safety principles in DOE/RL-96-0006. The functions of this standard are implemented by SRD Safety Criteria 4.1-3 and 4.1-4 and Appendix A to Volume II of the SRD.

Page 2-8, Section 2.3.1, Performance Category 1 and 2 Structures, Systems, and Components

Use 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Page 2-12, Section 2.3.2, Performance Category 3 and 4 Structures, Systems, and Components

Disregard the requirements for PC-4 SSCs.

Justification: There are no PC-4 SSCs at the RPP-WTP Facility.

Design PC-3 (Seismic Category I) SSCs for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft) with no credit for inelastic energy absorption. Note: Credit for inelastic energy absorption is allowed in the design of PC-3 (Seismic Category II) SSCs.

Justification: This change is made for consistency with NRC acceptance criteria.

Use ACI 349 for design of reinforced concrete in lieu of UBC.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Use ANSI/AISC N690 for design of structural steel in lieu of UBC.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Page 2-15, Section 2.3.3, Damping Values for Performance Category 3 and 4 Structures, Systems, and Components

Use ASME Code Case N-411 damping value for piping in lieu of those shown in Table 2-3.

Justification: This value is acceptable to the NRC for nuclear power plants.

Page 2-18, Section 2.4.1, Equipment and Distribution Systems

Perform seismic design of PC-1 and -2 elements of structures and equipment per the provisions of 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Page 2-22, Section 2.4.2, Evaluation of Existing Facilities

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Page 2-24, Section 2.5, Summary of Seismic Provisions

Disregard the requirements for PC-4 SSCs.

Justification: There are no PC-4 SSCs at the RPP-WTP Facility.

Design PC-3 (Seismic Category I) SSCs for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft) with no credit for inelastic energy absorption. Note: Credit for inelastic energy absorption is allowed in the design of PC-3 (Seismic Category II) SSCs.

Justification: This change is made for consistency with NRC acceptance criteria.

Use the seismic provisions in Table 2-5 concerning PC-3 SSCs except that the structural capacity is to be based on code ultimate strength or allowable behavior level.

Justification: Limit-state level method of determining the structural capacity is more appropriate for evaluation of existing facilities (the RPP-WTP Facility is a new facility).

Page 3-1, Section 3.1, Introduction

Perform performance categorization of SSCs per SRD Safety Criteria 4.1-3 and 4.1-4 in lieu of DOE-STD-1021-93.

Justification: DOE-STD-1021-93 is inconsistent with the top-level safety principles in DOE/RL-96-0006. The functions of this standard are implemented by SRD Safety Criteria 4.1-3 and 4.1-4 and Appendix A to Volume II of the SRD.

Page 3-2, Section 3.2, Wind Design Criteria

Use peak gust speed values contained in Attachment "A" of DOE Interim Advisory dated 1/22/98 in lieu of fastest-mile wind speeds shown in Table 3-2; also, per DOE Interim Advisory, use an importance factor for PC-2 SSCs of 1.0 in lieu of 1.07 indicated in Table 3-1.

Justification: The Newsletter was issued by DOE as an interim measure for use with DOE-STD-1020-94 until such time as the standard is revised.

Page 3-5, Section 3.2.1, Performance Category 1

Design structural steel PC-1 structures per AISC Manual of Steel Construction, Allowable Stress Design, Ninth edition.

Justification: The AISC code is preferred to the UBC because it is a national consensus code.

Design reinforced concrete PC-1 structures per ACI 318-95.

Justification: The ACI 318 code is preferred to the UBC because it is a national consensus code.

Page 3-6, Section 3.2.2, Performance Category 2

Design structural steel PC-2 structures per AISC Manual of Steel Construction, Allowable Stress Design, Ninth edition.

Justification: The AISC code is preferred to the UBC because it is a national consensus code.

Design reinforced concrete PC-2 structures per ACI 318-95.

Justification: The ACI 318 code is preferred to the UBC because it is a national consensus code.

Page 3-6, Section 3.2.3, Performance Category 3

Design structural steel PC-3 structures per ANSI/AISC N690-94.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Design reinforced concrete PC-3 structures per ACI 349-97.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Disregard requirements for tornado design.

Justification: Tornado is not a credible NPH at the RPP-WTP Facility site.

Page 3-11, Section 3.2.4, Performance Category 4

Delete this section.

Justification: There are no PC-4 SSCs at the RPP-WTP Facility.

Page 3-13, Section 3.3, Evaluation of Existing SSCs

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Page 4-1, Section 4.0, Flood Design and Evaluation Criteria

Disregard criteria for the design of SSCs for river flooding.

Justification: River flooding is not a credible NPH at the RPP-WTP Facility site, and only the criteria dealing with local precipitation that affects roof design and site drainage are applicable to the RPP-WTP Facility design.

Page 4-4, Section 4.1.2, Flood Evaluation Process

Perform performance categorization of SSCs per SRD Safety Criteria 4.1-3 and 4.1-4 in lieu of DOE-STD-1021-93.

Justification: DOE-STD-1021-93 is inconsistent with the top-level safety principles in DOE/RL-96-0006. The functions of this standard are implemented by SRD Safety Criteria 4.1-3 and 4.1-4 and Appendix A to Volume II of the SRD.

Page 4-12, Section 4.2.4, Performance Category 4

Delete this section.

Justification: There are no PC-4 SSCs at the RPP-WTP Facility.

Page 4-13, Section 4.3.3, Site Drainage and Roof Design

Use 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Page 4-15, Section 4.4, Considerations for Existing Construction

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Page 4-16, Section 4.5, Probabilistic Flood Risk Assessment

Do not perform a probabilistic flood risk assessment of the RPP-WTP Facility site.

Justification: UCRL-21069, "Probabilistic Flood Hazard Assessment for the N Reactor, Hanford, Washington," July 1988, contains a probabilistic flood risk assessment of the N reactor site. The RPP-WTP site is close to the N Reactor site (about 10 miles away) and further away from the Columbia River. Therefore, the N Reactor flood assessment may be used and no assessment of the RPP-WTP site is required.

Page B-4, App. B, Section B.2, Graded Approach, Performance Goals, and Performance Categories

Perform performance categorization of SSCs per SRD Safety Criteria 4.1-3 and 4.1-4 in lieu of DOE-STD-1021-93.

Justification: DOE-STD-1021-93 is inconsistent with the top-level safety principles in DOE/RL-96-0006. The functions of this standard are implemented by SRD Safety Criteria 4.1-3 and 4.1-4 and Appendix A to Volume II of the SRD.

Page B-8, App. B, Section B.3, Evaluation of Existing Facilities

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Page C-1, App. C, Section C.1, Introduction

Perform performance categorization of SSCs per SRD Safety Criteria 4.1-3 and 4.1-4 in lieu of DOE-STD-1021-93.

Justification: DOE-STD-1021-93 is inconsistent with the top-level safety principles in DOE/RL-96-0006. The functions of this standard are implemented by SRD Safety Criteria 4.1-3 and 4.1-4 and Appendix A to Volume II of the SRD.

Page C-19, App. C, Section C.3.2, Earthquake Ground Motion Response Spectra

Disregard Section C.3.2.1 discussion and Table C-4. Follow 1997 UBC for the RPP-WTP Facility design.

Justification: Section C.3.2.1 discussion and Table C-4 are based on 1994 UBC; the 1997 UBC is more current.

Page C-27, App. C, Section C.4, Evaluation of Seismic Demand (Response)

Use 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Page C-29, App. C, Section C.4.1, Dynamic Seismic Analysis

Use ASCE 4-98 (Draft) in lieu of ASCE 4-86.

Justification: ASCE 4-98 (Draft) is more current.

Page C-31, App. C, Section C.4.2, Static Force Method of Seismic Analysis

Use 1997 UBC in lieu of 1994 UBC.

Justification: 1997 UBC is more current.

Page C-32, App. C, Section C.4.3, Soil-Structure Interaction

Use ASCE 4-98 (Draft) in lieu of ASCE 4-86.

Justification: ASCE 4-98 (Draft) is more current.

Page C-38, App. C, Section C.4.4, Analytical Treatment of Energy Dissipation and Absorption

Design PC-3 (Seismic Category I) SSCs for the elastic seismic response to DBE per Section 3.7.2 of NRC NUREG-0800, Rev. 3 (Draft) with no credit for inelastic energy absorption. Note: Credit for inelastic energy absorption is allowed in the design of PC-3 (Seismic Category II) SSCs.

Justification: This change is made for consistency with NRC acceptance criteria.

Page C-52, App. C, Section C.5.1, Capacity Approach

Use ACI 349 for design of reinforced concrete in lieu of UBC.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Use ANSI/AISC N690 for design of structural steel in lieu of UBC.

Justification: This change is made for consistency with NRC acceptance criteria contained in Section 3.8.4 of NUREG-0800, Rev. 2 (Draft).

Page C-62, App. C, Section C.7, Special Considerations for Existing Facilities

Delete this section.

Justification: This section deals with existing facilities and the RPP-WTP Facility is a new facility.

Y.0* ANSI/AISC N690, "Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities"

* When the ABAR is approved and incorporated, "Y.0" will be replaced by the next section number in Appendix C to Volume II of the SRD.

Revision: 1994

Sponsoring Organization: American National Standards Institute/American Institute of Steel Construction

RPP-WTP Specific Tailoring

The following tailoring of ANSI/AISC N690 is required for use by BNFL as an Implementing Standard for structural design.

Page 22, Section Q1.5.7.1, Primary Stresses

Revise the stress limit coefficients for compression in Table Q1.5.7.1 as follows:

- 1.3 instead of 1.5 [stated in footnote (c)] in load combinations 2, 5, and 6
- 1.4 instead of 1.6 in load combinations 7, 8, and 9
- 1.6 instead of 1.7 in load combination 11

Justification: These changes are made for consistency with the NRC requirements of Appendix F of Section 3.8.4 of NUREG-0800 (Draft Rev. 2).